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ABSTRACT

This report summarizes a study undertaken to determine and describe a "generic" set of microcomputer competencies that should be possessed by all professional secondary school personnel and a more "specialized" set of microcomputer competencies that are expected to be possessed by secondary school professionals who work intimately with microcomputers, including library media specialists. A questionnaire sent to a representative sample of microcomputer-using media specialists and educators (N=222) asked them to rank each of 36 competencies that might be required in their work situations. Based on replies from 65.5% of the subjects, "generic" and "specialized" competencies were identified. It is suggested that increased emphasis be placed on the following aspects of school media specialist and classroom instructor training in computer technology: (1) use of the microcomputer as an instructional tool rather than as a programming device; (2) instruction for all professional school personnel on the possible uses of the microcomputer in their daily tasks, finding information about computers in education, types of computer-assisted instruction, and evaluating software appropriate to grade level and subject specialization; and (3) ensuring that all school media specialists and teachers are capable of operating several types/brands of microcomputer software. A brief bibliography is provided. (KM)

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COMPUTER COMPETENCIES FOR SCHOOL LIBRARY MEDIA SPECIALISTS

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This author recently completed an investigative study[1] of the microcomputer literacy skills that should be required for public secondary school teachers. The term "teachers" was taken to include instructors of Language Arts, Natural Sciences, Mathematics, Social Sciences and, most importantly, professional Library Media support personnel. The purposes of the study were to determine and describe: 1) a "generic" set of microcomputer competencies that should be possessed by all professional secondary school personnel; and 2) a more "specialized" set of microcomputer competencies that are expected to be possessed by secondary school professionals who work intimately with the microcomputer. This last group included Library Media specialists.

One of the initial problems addressed in this study was the plethora of definitions of the construct "computer literacy." The many definitions of this construct were found to fall into three distinct areas of concern. The first area was found to place an emphasis on a knowledge of computer architecture and a facility with programming abilities. This view was the most prevalent one during the early 1970's. It was during this era that Arthur Luehrmann[2] coined the term "computer literacy." In doing so, Luehrmann essentially put two unrelated terms together and played on the metaphor that the latter implies. To be "computer literate," according to this view, means the ability to program a computer and to intelligently discuss the capabilities and limitations of computers. This view soon faced a second definitional area of concern that stressed the awareness of computers, their application to problem solving, and a knowledge of the impact of computers on modern life.[3] Here "computer

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literacy" was taken to entail "the range of skills and understandings needed to function effectively in a society increasingly dependent on computer and information technology."[4] The dichotomy in definitions finally gave into a third or compromise position. A third, and the most current trend in the definitions, is the tendency to take a middle-of-the-road perspective in which computer literacy is seen as a combination of both the awareness issues and the ability to program.

In order to conduct a descriptive study such as this one, several distinct steps were taken. These tasks were: 1) the identification of a universe of competencies that microcomputer-using instructors and library media specialists might be required to demonstrate in their work situation; 2) the design and field-testing of an instrument for the rating of the competencies from "required to be possessed" to "inappropriate to possess;" 3) the drawing of a representative sample of microcomputer-using media specialists and educators; and 4) the administration of the instrument of the members of the sample. The survey instrument that was developed was sent to 222 individuals across the United States and a response rate of 65.5% was realized.

The questionnaire that was distributed requested the respondents to rank each of the thirty-six competencies on a scale that ranged from "Required only by those teachers who teach microcomputer courses" to "Inappropriate skill for teachers to possess." The final form of the instrument consisted of two sets of self-explanatory directions for completing the form. These sets of instructions included: 1) the purpose of the survey; 2) information about the format for marking the instrument; and 3) some demographic information.

A "40% Rule of Significance" was employed to interpret the data that was collected. The "40% Rule" adheres to the premise that, in order for a response

category to be identified as significant, each item must receive the same important ranking by 40% of the respondents and a frequency response level at least 5% greater than the next highest ranking on the same item. Theoretically, if no consensus were reached, each of the four possible choices would receive 25% of the responses. By employing the "40% Rule of Significance" the possibility of chance distribution was minimized.

The data collected within this study revealed that the competencies that should be required only of those teachers who teach microcomputer courses are:

1. Knowledge of and about computer architecture (how the machines operate internally);
2. Ability to compare and evaluate various microcomputer hardware systems;
3. Knowledge of what should be taught in a computer literacy course;
4. Knowledge of how and when to use flowcharting;
5. Ability to write programs in BASIC and PASCAL.

These skills and knowledges are generally considered the marks of a computer science professional. The competencies possessed by the instructor that teaches microcomputer courses would include these competencies and those skills that were identified as being required of all professional education personnel.

The competencies that were identified as being required of all professional school personnel, including school media specialists and instructors, were:

1. Knowledge of the components of a microcomputer system;
2. Knowledge of computer terminology well enough to explain it;
3. Knowledge of how to operate a microcomputer system;

4. Knowledge about the capabilities and limitations of microcomputers;

5. Knowledge of a variety of uses of the microcomputer in education and when to use the microcomputer in the teaching learning situation;

6. Knowledge of where to find information about computers in education and relevent teaching materials;

7. Ability to evaluate computer software according to grade level/subject specialization and its relationship to various types of computer-assisted instruction;

8. Awareness of the social impact of the microcomputer, including careers available as a result of the microcomputer;

9. Ability to discuss the moral and ethical aspects of computing.

It is assumed that a school media specialist would need to possess all of the above skills in order to be considered "computer literate." In addition to the above required skills, other competencies were identified as being recommended ones. The need for these was dependent upon one's teaching/learning situation. These recommended competencies were: 1) a knowledge of the history of computing, especially since 1945; and 2) the ability to use an authoring system, a word processing system, and a data-based management system to create educational products. The ability to program in both FORTRAN and COBOL languages was considered an inappropriate skill for all professional personnel in the school to possess.

The results of this study point to a redirection of the training for school media specialists and classroom instructors in relation to computer technology. A desire for an emphasis to be on the use of the microcomputer as an instructional tool rather than a programming device was expressed by the respondents to the survey. Programming abilities should be reserved for prospective teachers of computing, not the school media specialist or "generic"

teacher. Second, All professional school personnel should be instructed in the possible uses of the microcomputer in their daily tasks, how to find information about computers in education, the various types of computer-assisted instruction, and how to evaluate software appropriate to grade level and subject specialization. The school media specialist will need the latter to determine what items should be included in the inventory of programs available in a school. Third, All school media specialists and teachers should be capable of operating several types/brands of microcomputer software. One never knows what the principal or central office will deliver.

While the results of this study are not startling, they do point to a change in emphasis on the type of pre-service and in-service exposure that school media specialists and other professional education personnel receive concerning microcomputer technology.

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